

ABSTRACT OF THE DISCLOSURE

Since at least a portion of a trench capacitor electrode is formed by a metal, the electrical sheet resistance of the electrode can be lowered, and the signal propagation time prolonged by CR delay can be shortened. This can reduce the read/write time. The formation of a buried gate electrode can realize a reduction of the cell area, which is required in a DRAM- and a DRAM/logic-embedded device. This can increase the gate length and reduce the short channel effect. Since an insulating protective film is deposited on the gate electrode, a bit line contact can be formed in self-alignment.